



Armed Forces College of Medicine

AFCM



Back of Forearm

By

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INTENDED LEARNING OBJECTIVES (ILO)



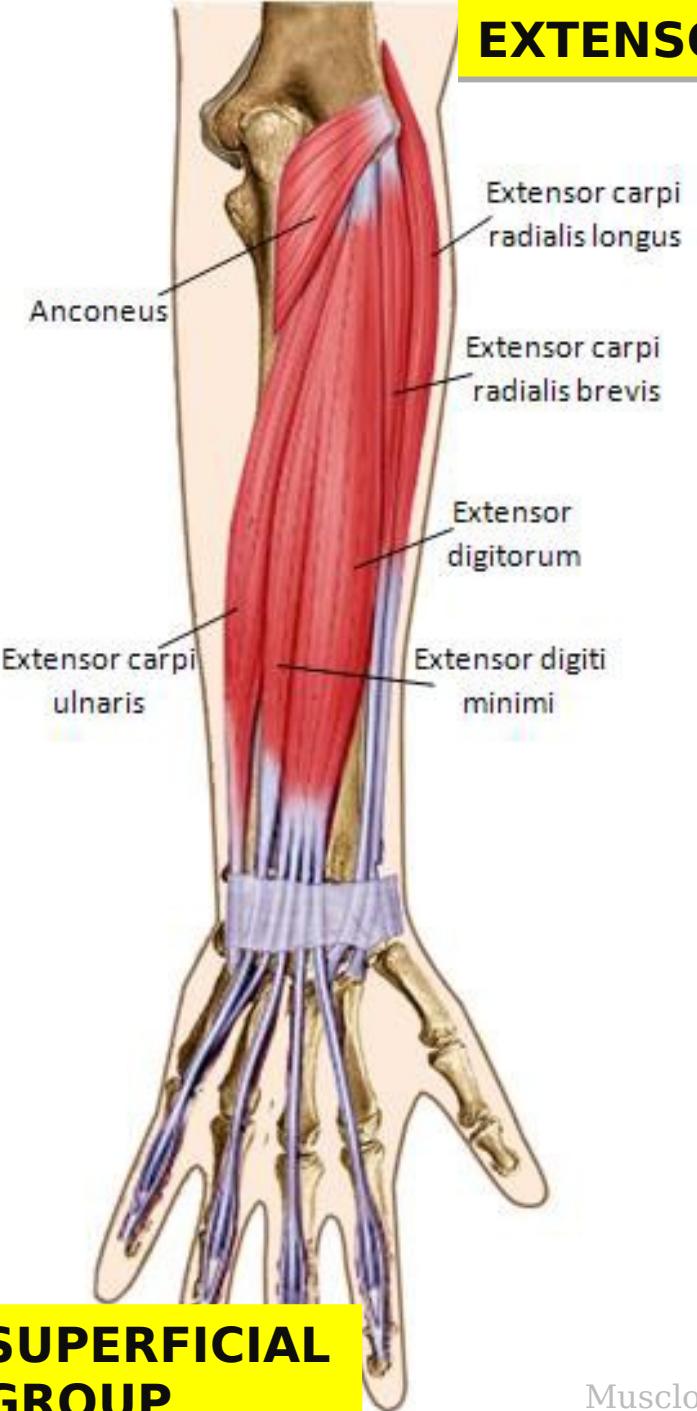
**By the end of this lecture the student
will be able to:**

1. Describe the attachment, action and nerve supply of muscles of the back of forearm ; superficial and deep.
2. Describe the origin, course and branches of posterior interosseous nerve.

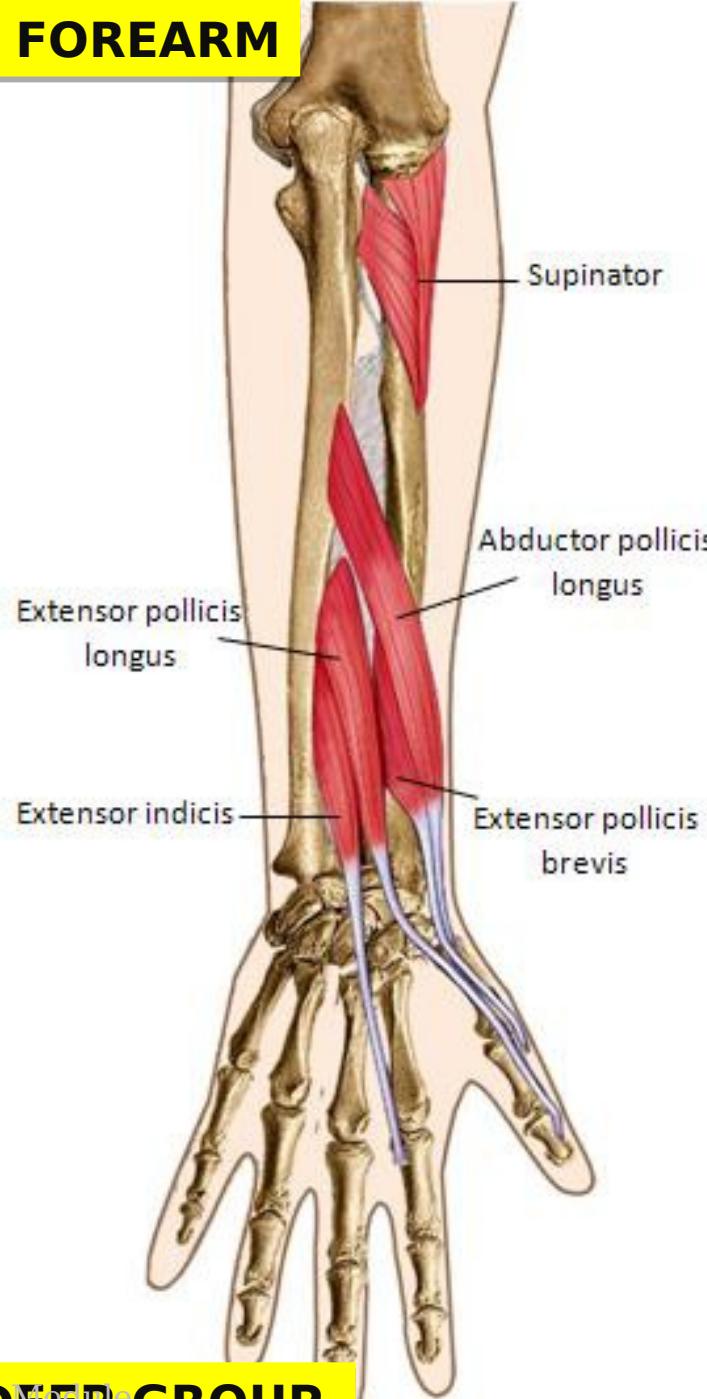
Muscles of the back of the forearm

- There are **12** muscles in this compartment arranged in **superficial** and **deep** groups .
- Superficial group □ 7 muscles
- Deep group □ 5 muscles
- All are innervated by the **Posterior interosseous nerve** except 3 muscles by the Radial nerve itself.

EXTENSOR MUSCLES OF FOREARM



SUPERFICIAL GROUP



DEEP GROUP

Superficial group

They are seven muscles one is short and six are long muscles.

The short one is called **anconeus** (1) and **6 long muscles** arranged as follow :

3 run along the lateral border of the forearm:

2) **brachioradialis**

3) **extensor carpi radialis longus**

Bentus scles up along the vis posterior surface of the forearm:

5) **Extensor digitorum**

6) **Extensor digiti minimi**

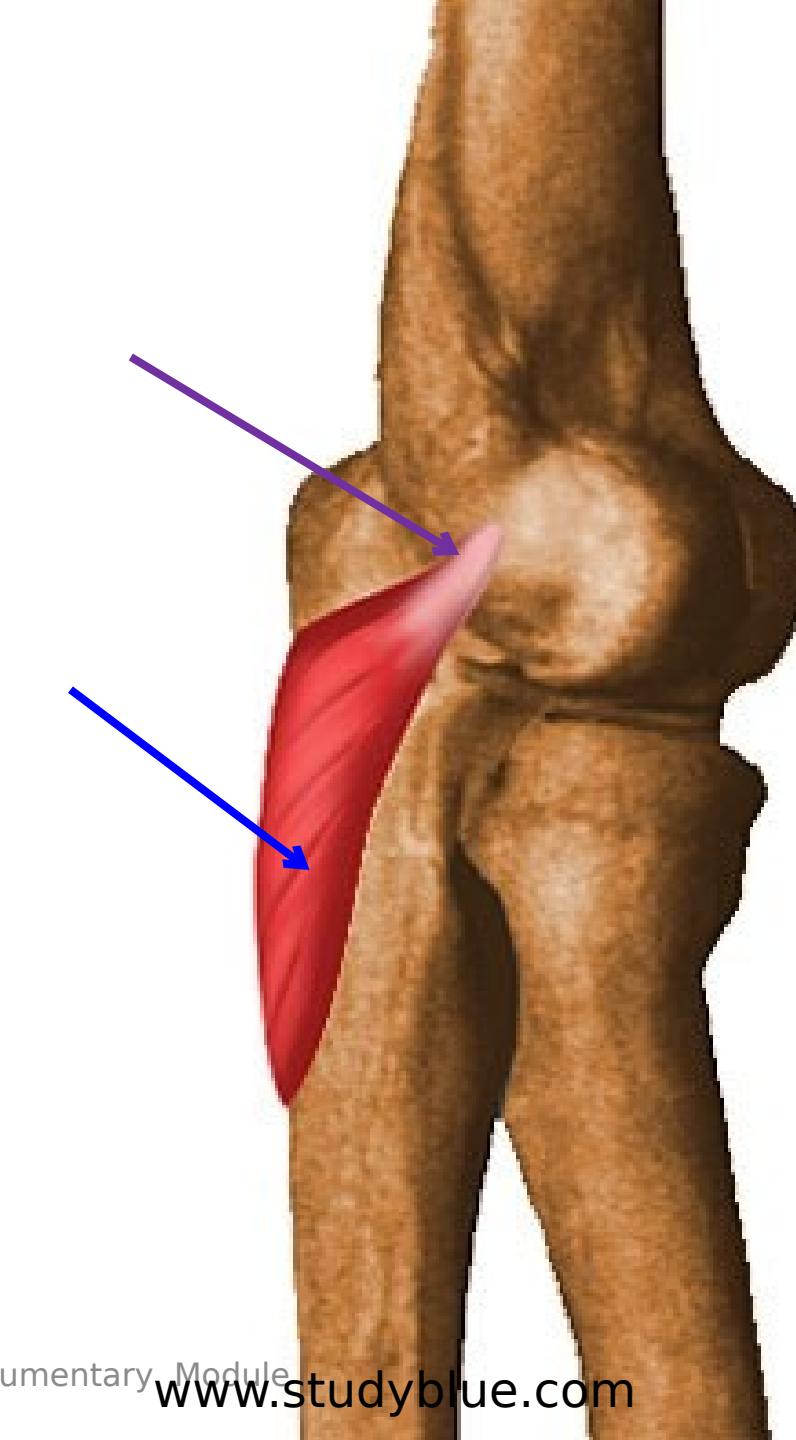
7) **Extensor carpi ulnaris**

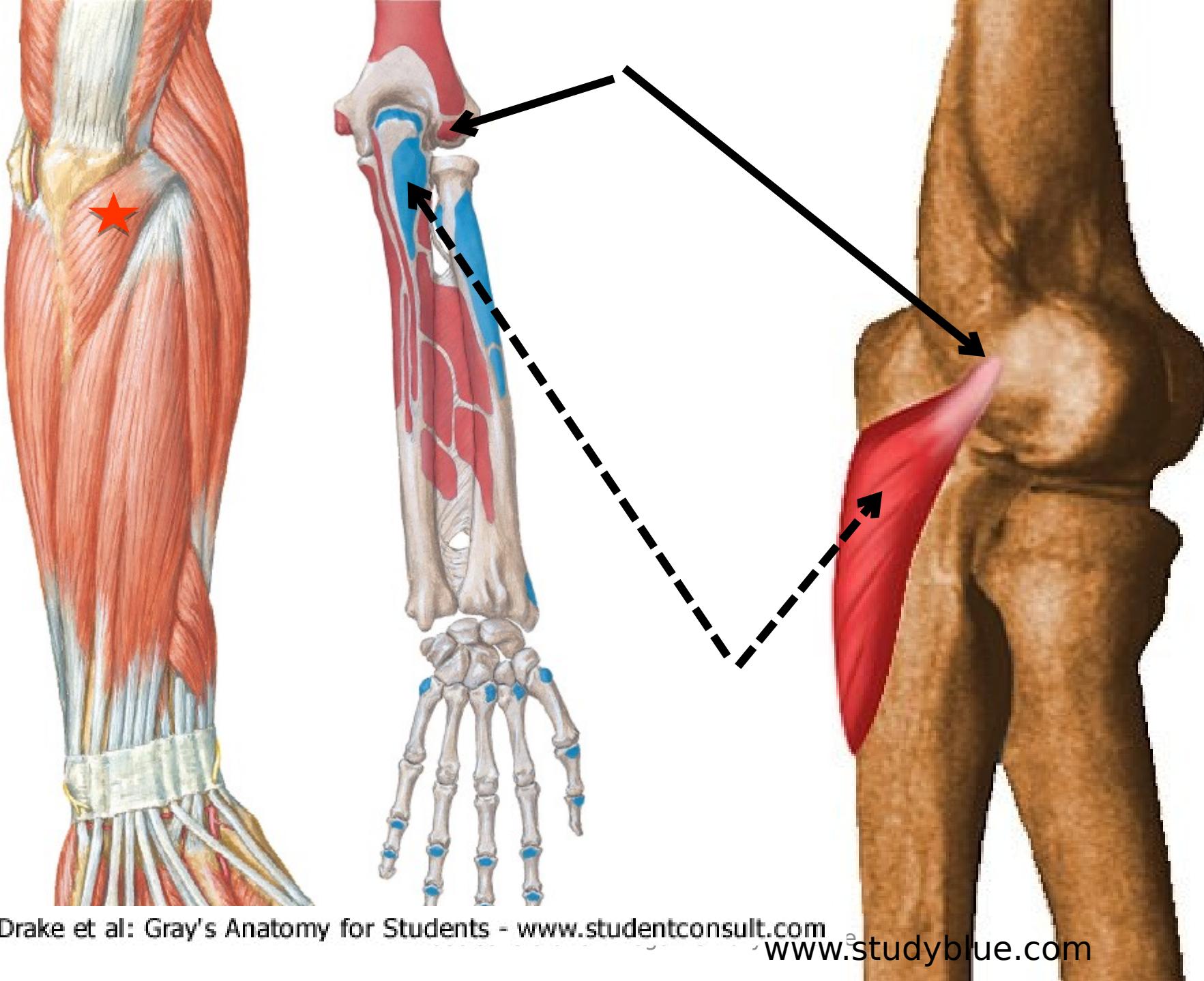




Anconeus

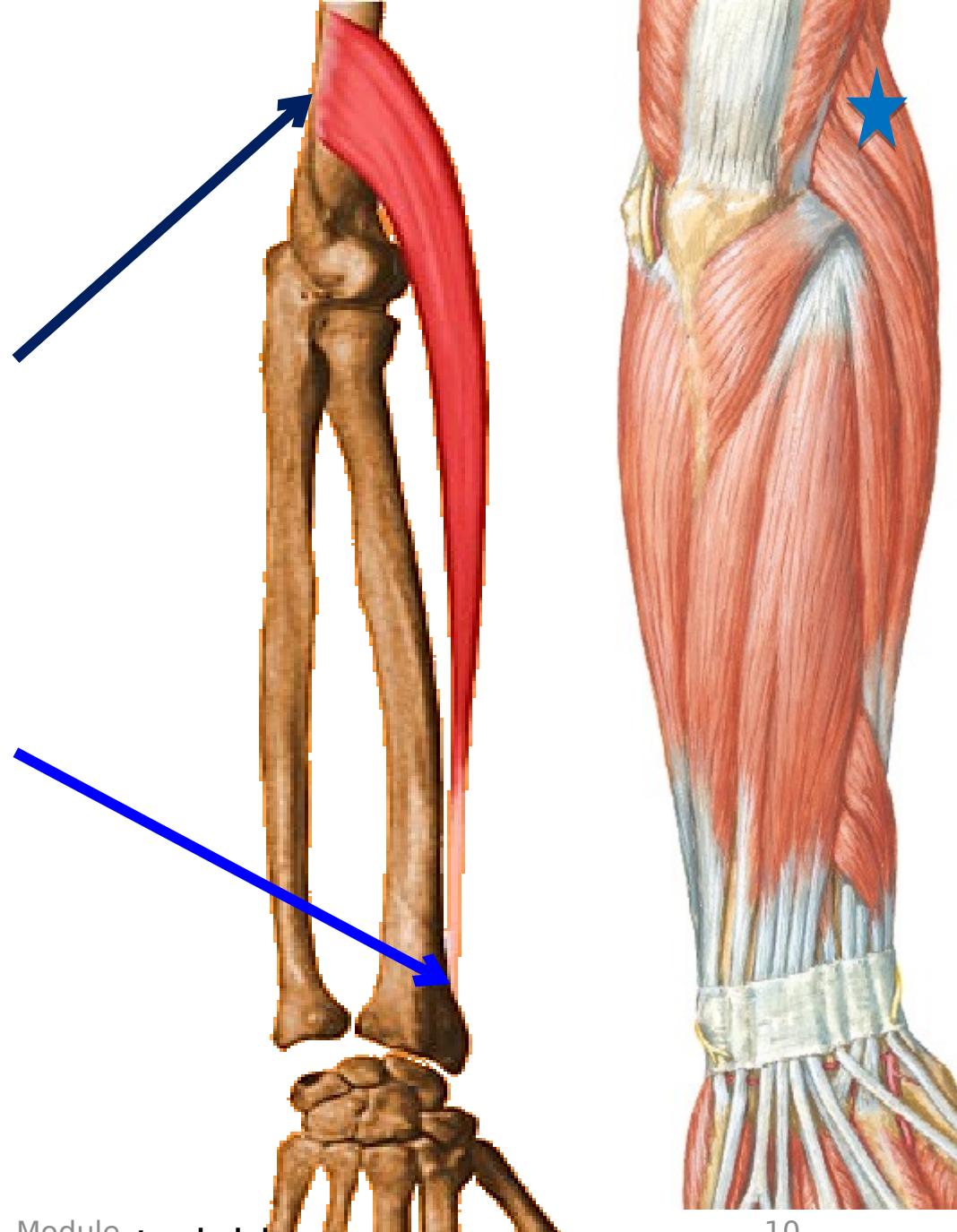
- **Origin :**from the back of the lateral epicondyle of the humerus .
- **Insertion :**into the lateral side of the olecranon process and upper part of the posterior surface of ulna.
- **Action :**
- Assists triceps in extension of the elbow.





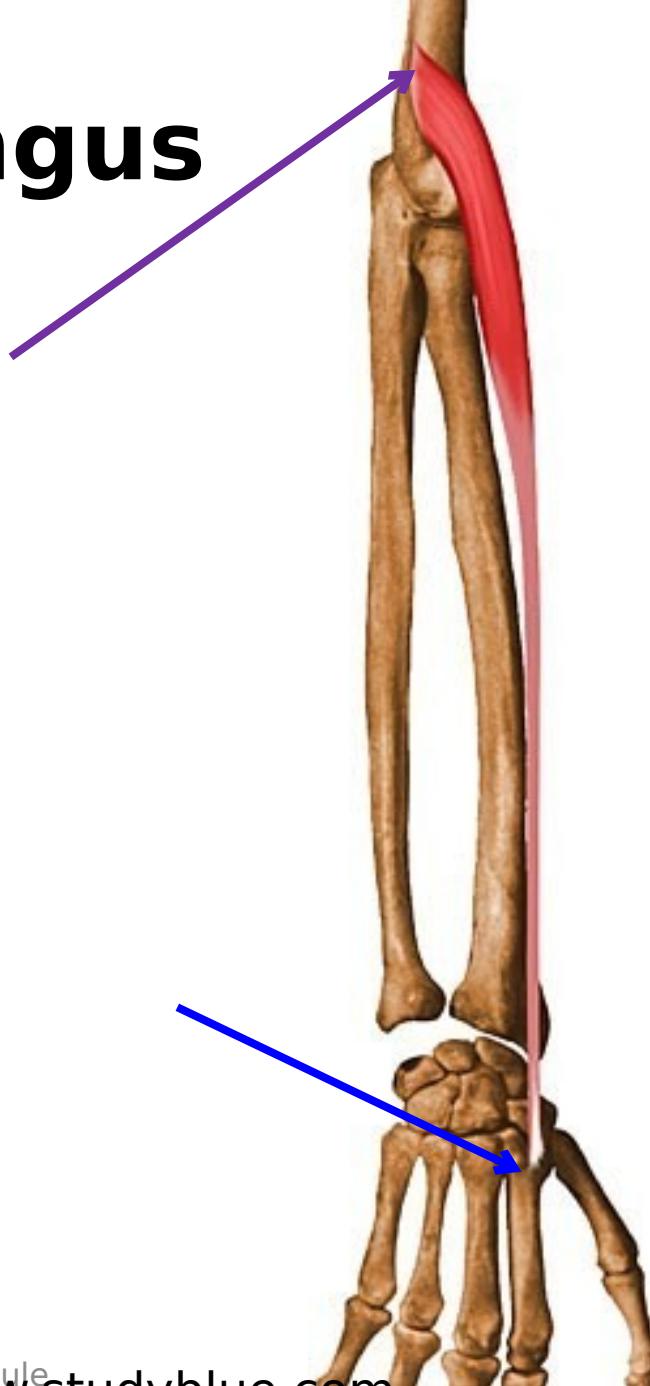
Brachioradialis

- **Origin** :from the upper two third of the lateral supracondylar ridge.
- **Insertion** :into the base of the styloid process of radius.
- **Action** :
- Flex the elbow in mid prone position .



Extensor carpi radialis longus

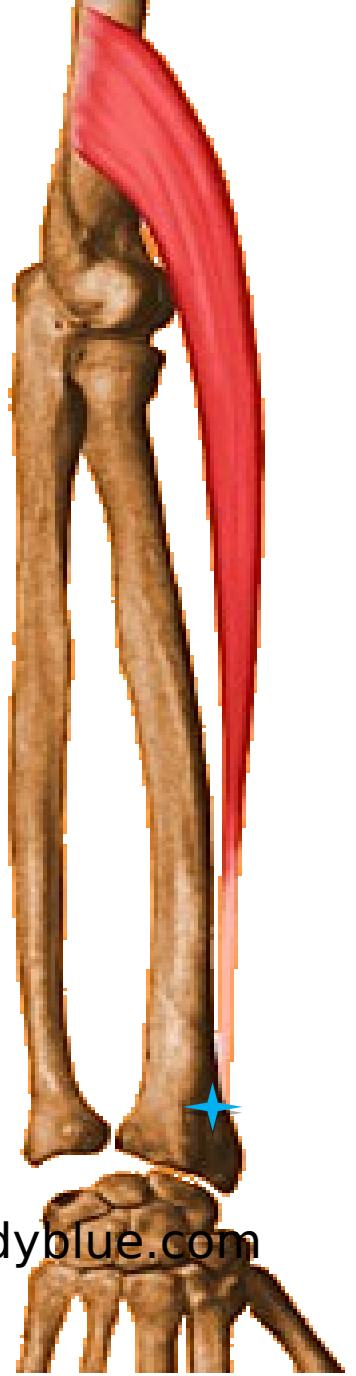
- **Origin :** from the lower one third of the lateral supracondylar ridge.
- **Insertion :** into the back of the base of the second metacarpal bone.
- **Action :**
Extends wrist and abducts the hand at the wrist (with extensor carpi radialis brevis & flexor carpi radialis)



Extensor carpi radialis brevis

- **Origin** : from the common extensor origin □ the front of the lateral epicondyle of humerus .
- **Insertion** : into the back of the base of the third metacarpal bone.
- **Action** : Extends and abducts the hand at the wrist joint.

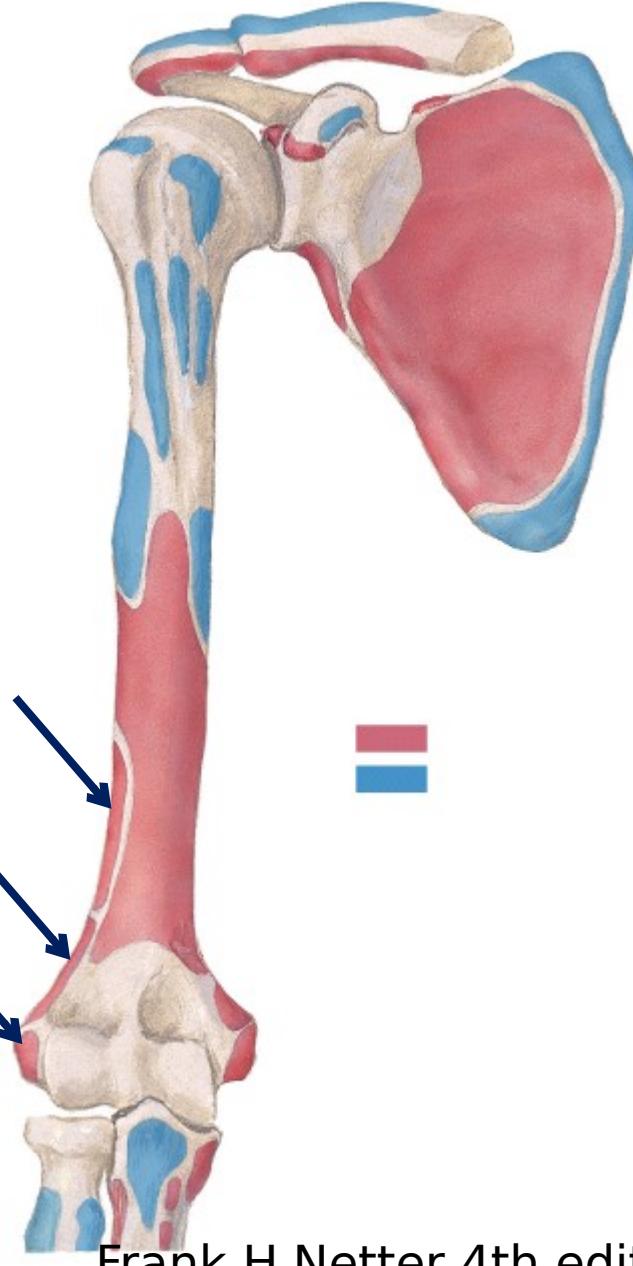




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Musculoskeletal & Integumentary Module

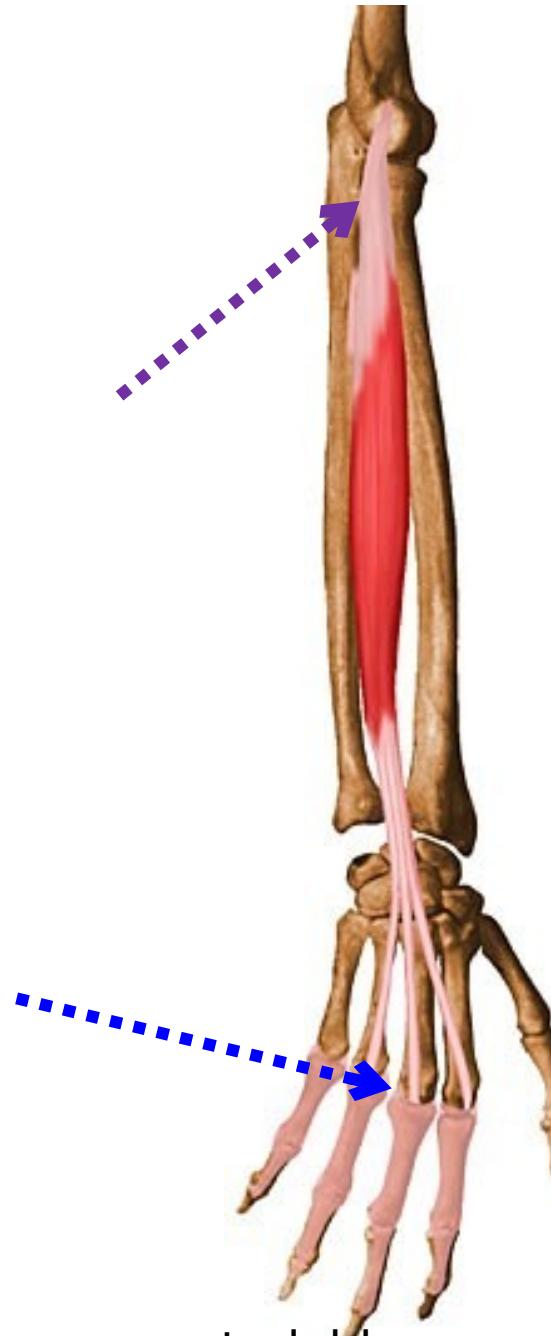


Frank H. Netter 4th edition

Extensor digitorum

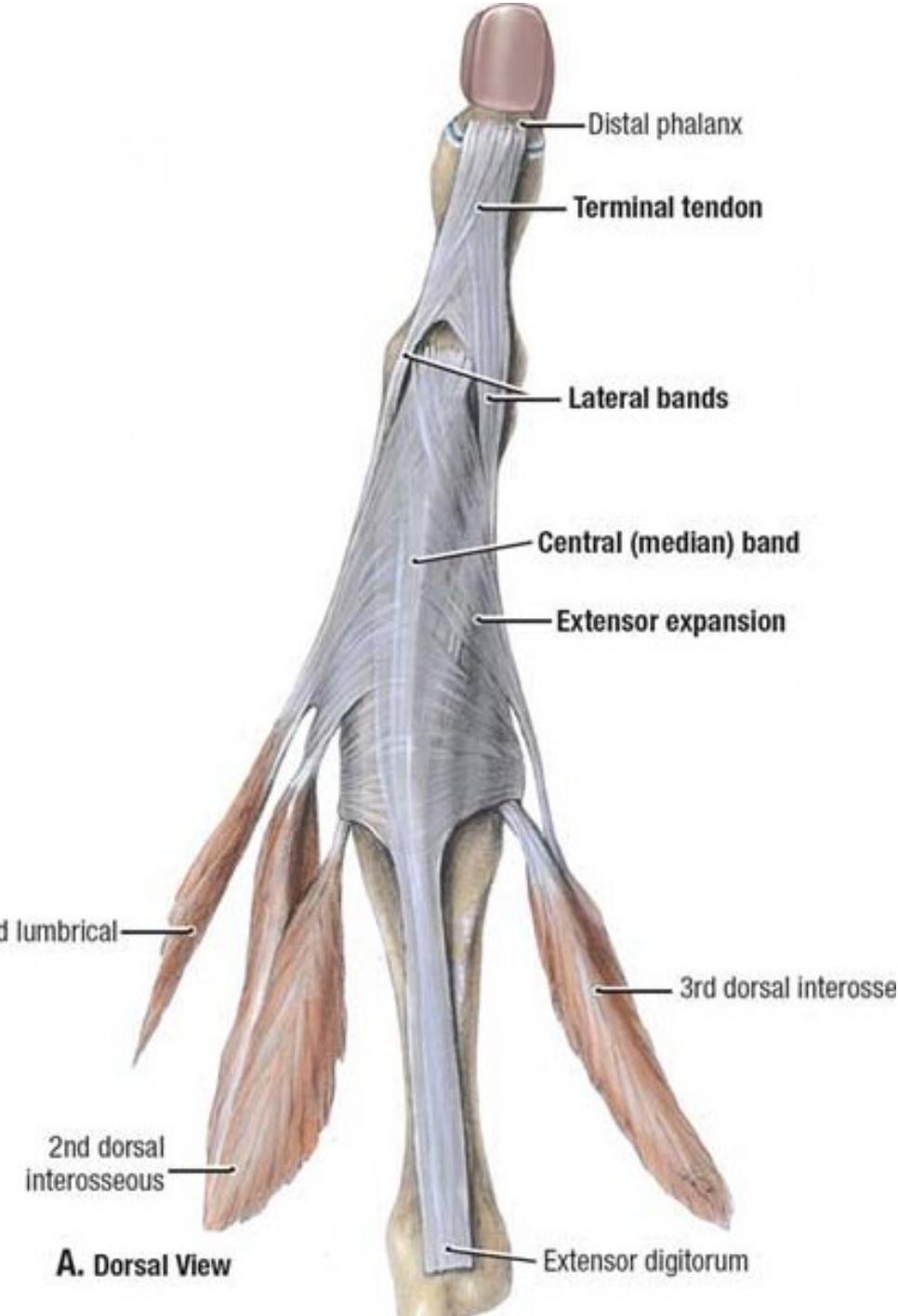
- **Origin :** from the common extensor origin.
- **Insertion :** by four tendons into the back of the bases of the middle and distal phalanges of the medial four fingers through extensor expansion.

- **Action :**
Extension of the metacarpophalangeal and interphalangeal joints of the medial four fingers



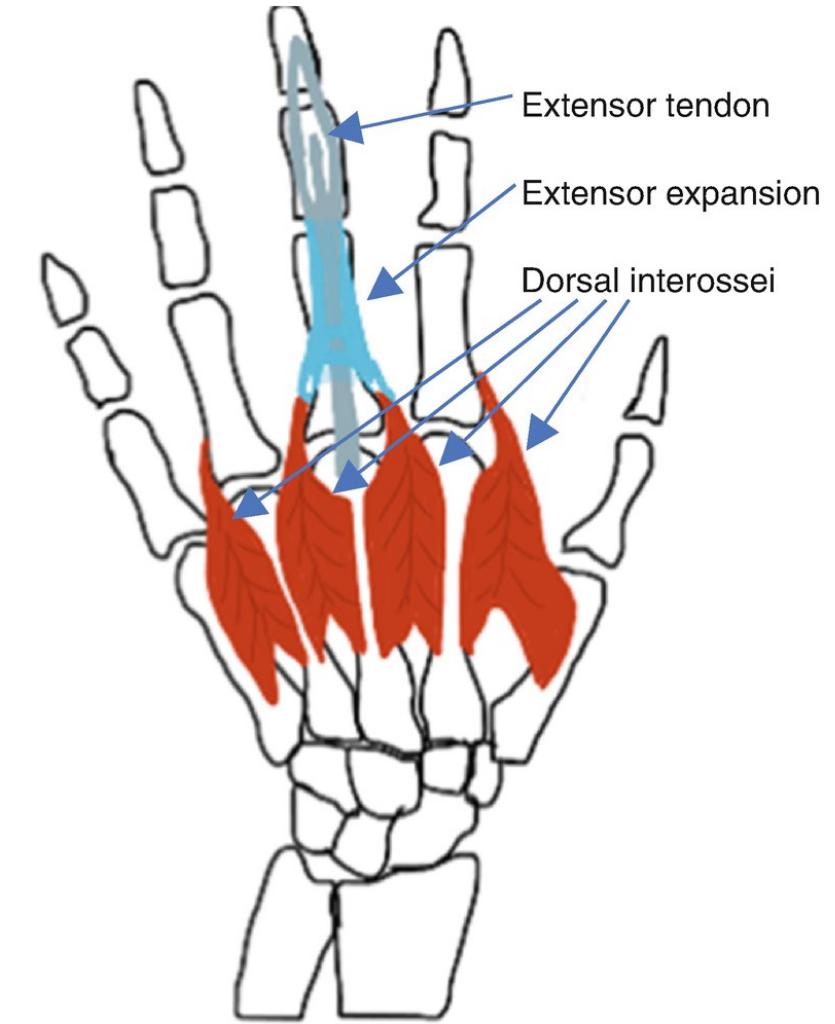
•Extensor expansion:

- The tendons of the extensor digitorum have a special pattern of insertion ;dorsal to its corresponding **proximal phalanx**, each tendon flattens out to form an **extensor expansion** which divides into **three** slips:
- A central slip attaches to the base of the middle phalanx and two collateral slips are joined by tendons of interossei and lumbrical muscles and then they attach to the base of the distal phalanx.





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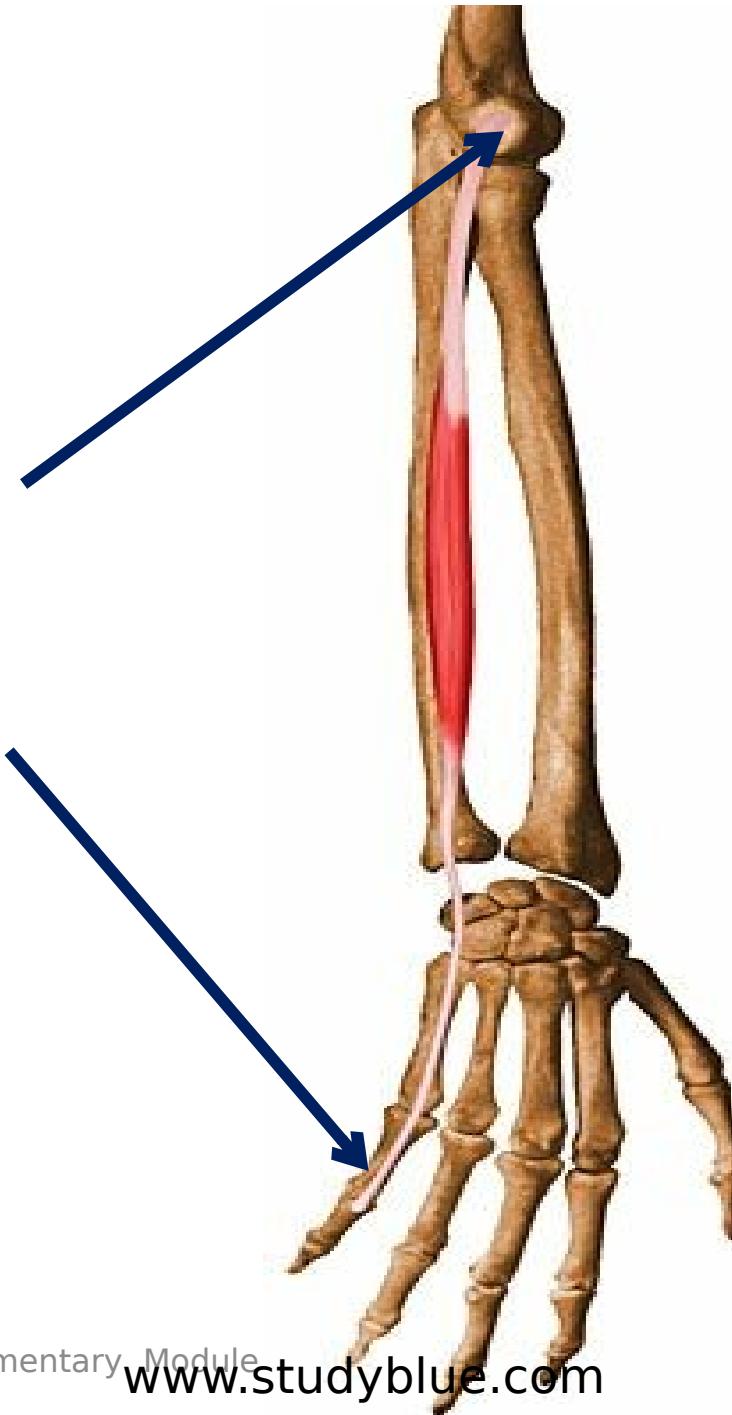


Hand Trauma in Clinical Practice pp 1-2

Extensor expansion

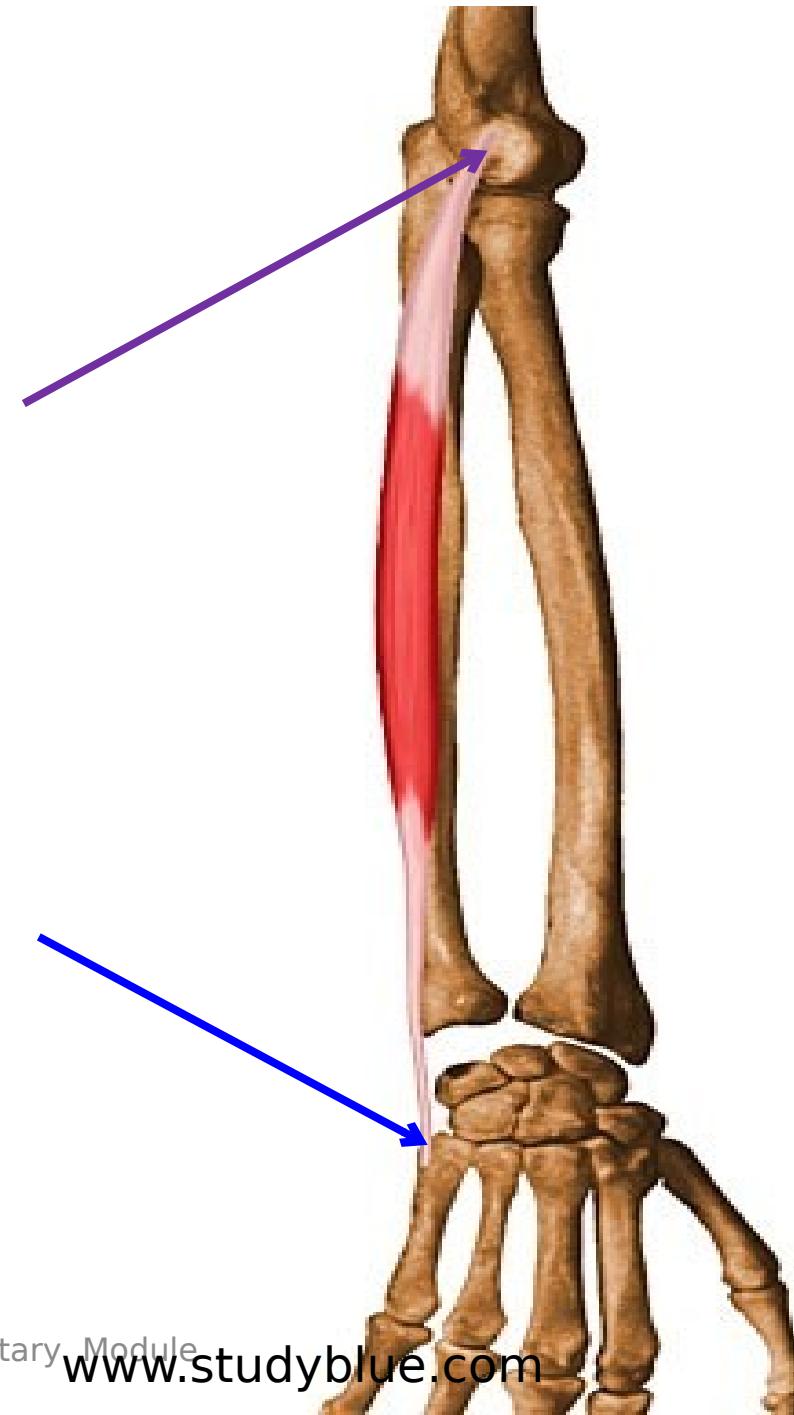
Extensor digiti minimi

- **Origin :** from the common extensor origin.
- **Insertion :** its tendon joins the extensor expansion of the little finger.
- **Action :**
 - Extends all the joints of the little finger



Extensor carpi ulnaris

- **Origin :**from the common extensor origin.
- **Insertion :**into the back of the base of the fifth metacarpal bone.
- **Action :**
- Extends the wrist and adducts the hand at the wrist (with flexor carpi ulnaris)



Deep group of Extensors

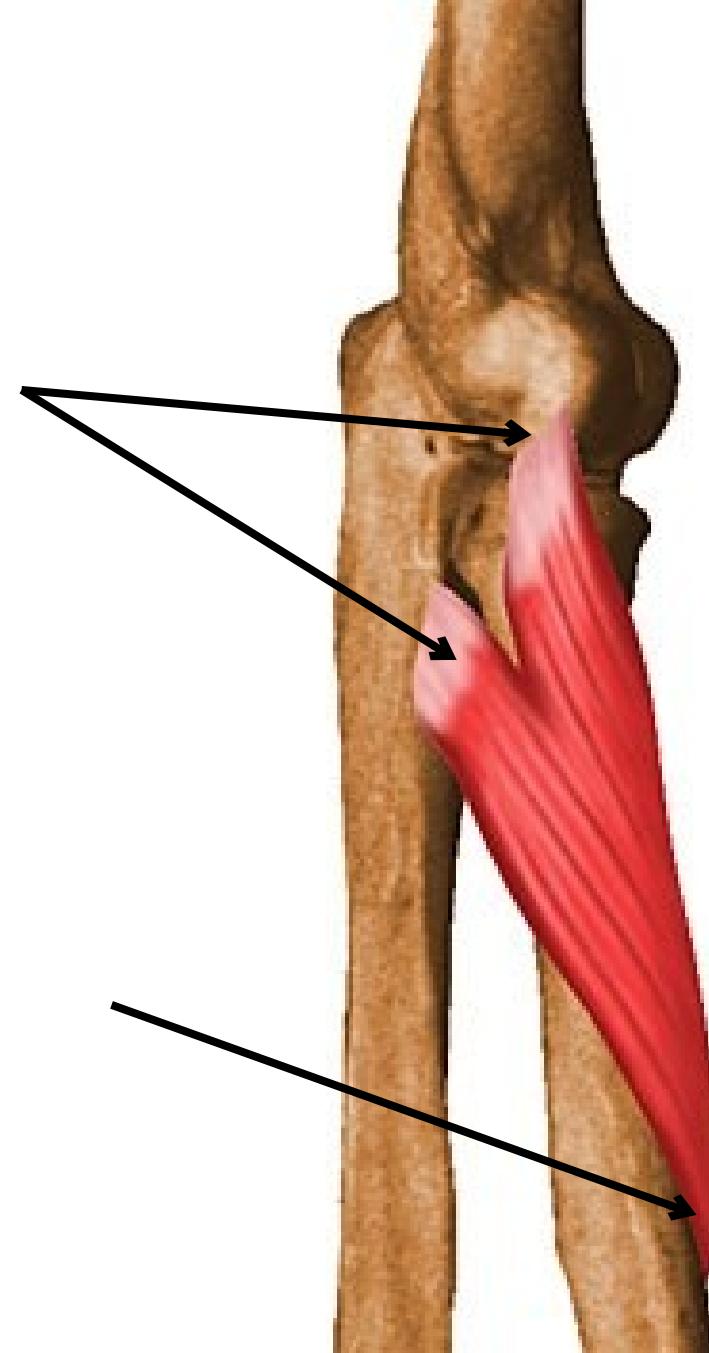
- They are five muscles one is short and four long muscles.
- The short one is called **supinator** and 4 long muscles arranged as follows :
- **3 go to the thumb**
(pollex) □ abductor pollicis longus , extensor pollicis brevis, extensor pollicis longus.
- One goes to the index finger□ extensor indicis.



	Supinator
	Abductor pollicis longus
	Extensor pollicis longus and brevis
	Extensor indicis

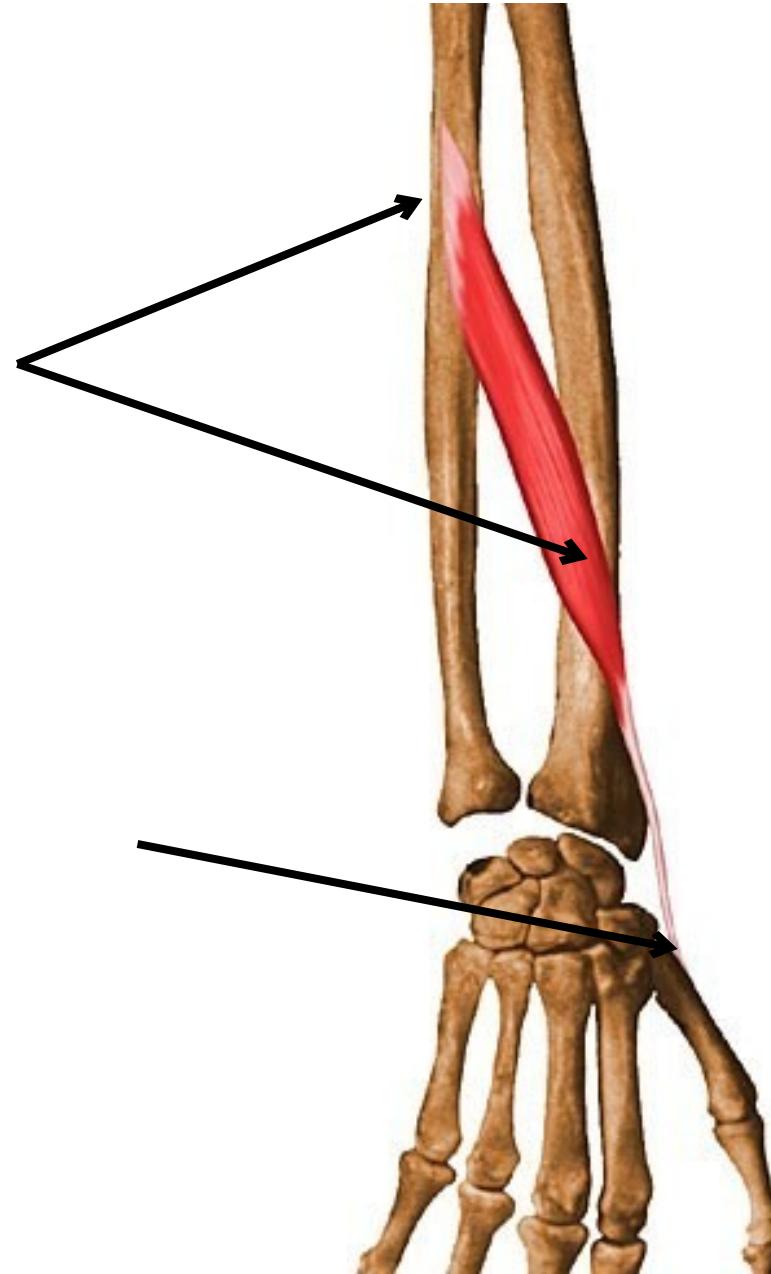
Supinator

- **Origin :** by two heads :
- Superficial head from the tip of the lateral epicondyle of humerus
- Deep head from supinator fossa and supinator crest of ulna .
- **Insertion :** into the front, the lateral surface & back of upper 1/3 of radius .
- **Action :**
- Supinates the extended



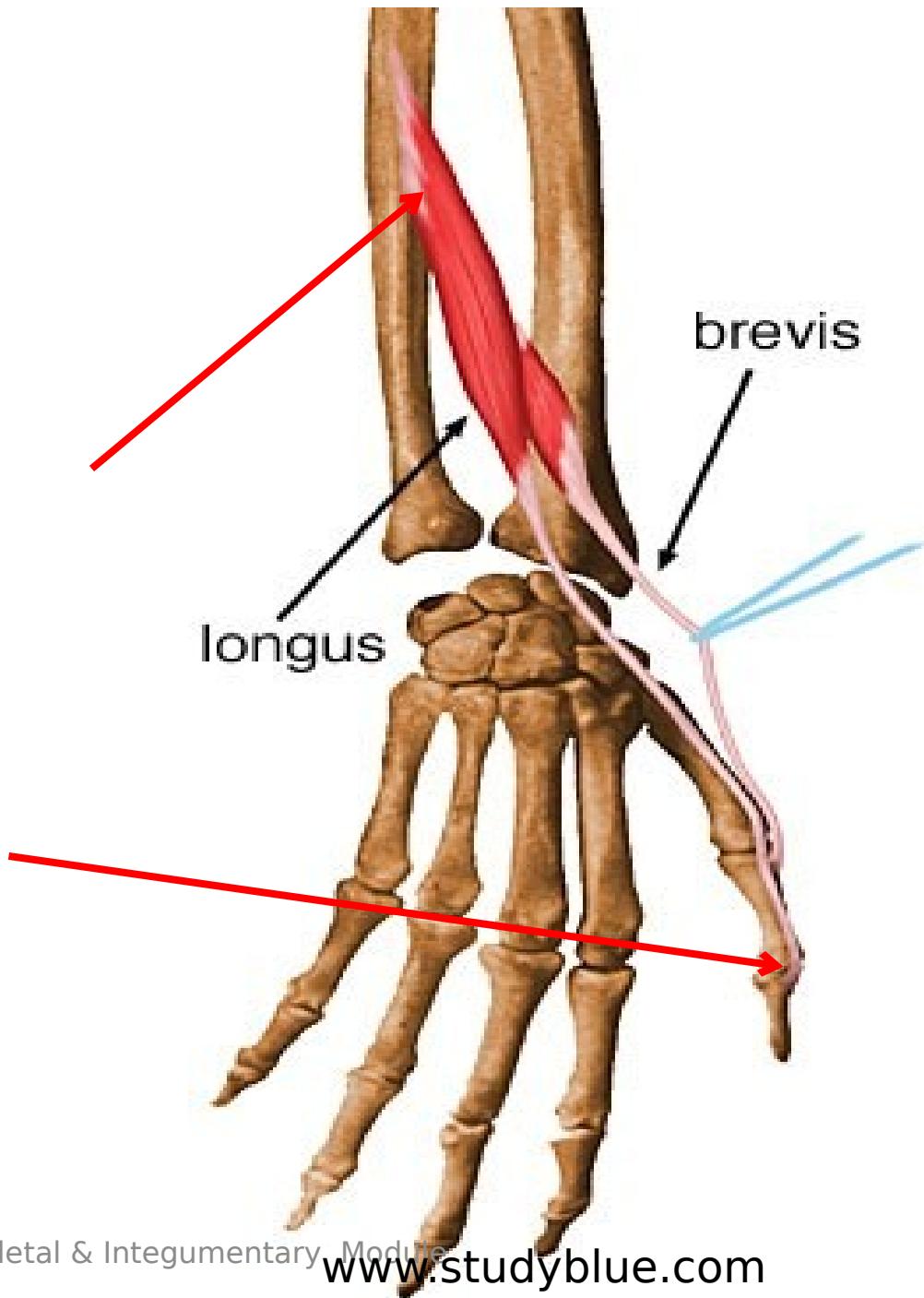
Abductor pollicis longus

- **Origin :**
- Upper part of the back of the radius & ulna
- **Insertion :** into the lateral side of the base of the first metacarpal bone of the thumb.
- **Action :** abducts and extends the thumb at the carpometacarpal joint.



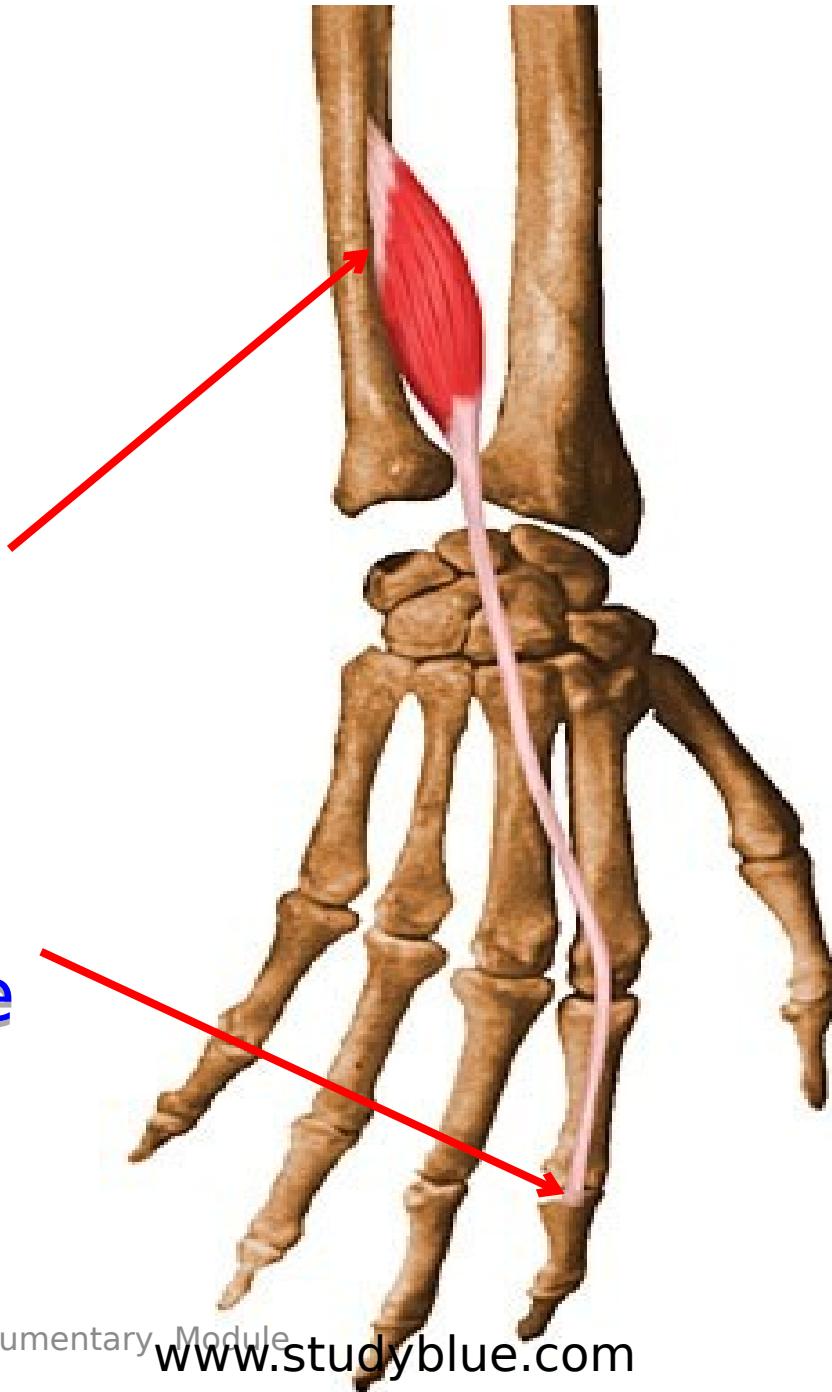
Extensor pollicis longus

- **Origin :**from the posterior surface of ulna below abductor pollicis longus
- **Insertion :**into the back of the base of distal phalanx of the thumb.
- **Action :**extends the distal phalanx of the thumb.



Extensor indicis

- **Origin :**from the posterior surface of ulna below extensor pollicis longus .
- **Insertion :**into the extensor expansion of the index .
- **Action :**extends the joints of the index finger .



Nerve supply of the extensor g



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- All extensor muscles at the back of forearm are supplied by **POSTERIOR
INTEROSSEOUS NERVE** (the deep terminal branch of radial nerve), EXCEPT anconeus ,brachioradialis, and extensor carpi radialis longus are supplied by the radial nerve.

All muscles of back of forearm are supplied by posterior interosseus nerve except brachioradialis, Extensor carpi radialis longus, Anconeus

Muscles supplied by radial nerve

TABEB

T: Triceps

A: Anconeus

B: Brachialis

E: Extensor carpi radialis longus

B: brachioradialis

Lecture Quiz

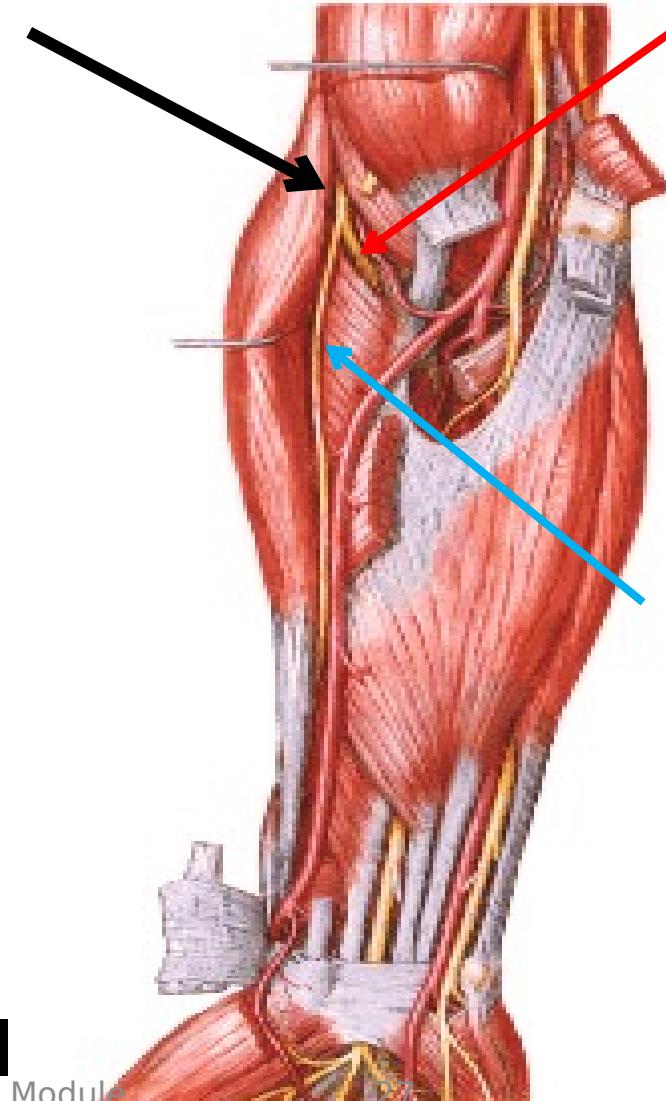


Which one of the following muscles can extend the wrist and help abduction of the hand at the wrist?

- a) Extensor digitorum
- b) Extensor digiti minimi
- c) Flexor carpi radialis
- d) Extensor carpi radialis longus
- e) Abductor pollicis longus

Radial Nerve in the Forearm

- Radial nerve ends in front of lateral epicondyle of humerus by dividing into **superficial & deep branches**.
- **The superficial branch** continues in front of forearm under cover of brachioradialis & lateral to radial artery. It then passes posteriorly to reach dorsum of hand & supply skin of lateral 2/3 of dorsum of hand & dorsal surface of lateral 3½ fingers



- **The deep terminal branch of Radial Nerve (Posterior interosseous nerve) :**

- It is a **purely MOTOR** nerve.
- The nerve reaches the back of forearm by piercing supinator muscle.
- It supplies all extensors of the forearm (supinator, extensor digitorum, extensor digiti minimi, extensor carpi ulnaris, and the 3 muscles of the thumb (abductor pollicis longus, extensor pollicis brevis and longus) and extensor indicis muscle, EXCEPT



- **3 back of forearm muscles which are supplied by the radial nerve itself** before it divides into its 2 terminal branches are:

- 1) Anconeus
- 2) Brachioradialis



Lecture Quiz



Which of the following muscles of the back of the forearm is supplied by the radial nerve itself & not by its posterior interosseous branch?

- a) Extensor digitorum
- b) Extensor digiti minimi
- c) Extensor indicis
- d) Extensor carpi radialis longus
- e) Extensor carpi radialis brevis

SUGGESTED TEXTBOOKS



Frank H.Netter 4th.edition

Gray' s Anatomy for students.www.studentconsult.com